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THE SWEDISH TRADE & INVEST COUNCIL

POWER TO AFRICA

Unlocking opportunities and partnerships for Swedish companies in Africa's energy transmission sector

BRIDGING AFRICA'S GAPS IN ENERGY ACCESS

In this report, we explore the potential for Swedish companies in Africa's energy transmission sector – presenting an overview of six major markets where opportunities are on the rise. Get the inside perspectives to capture the momentum.

The energy transmission sector in Africa is pivotal to ensure that the power generated from renewable energy sources can be efficiently transported to urban centres, industries, and rural communities. The African continent has abundant renewable energy resources – but the need to bridge the energy access gap is accelerating rapidly.

One of the key challenges facing Africa's energy landscape is the lack of robust transmission and distribution infrastructure. This hampers overall socio-economic progress and limits the ability to reap the benefits of renewable energy. That is why Africa's energy transmission sector currently reveals a diverse mix of opportunities that can be leveraged by Swedish companies, given their expertise in sustainable solutions and commitment to innovation.

The establishment of cross-border energy transmission networks is the best way of facilitating exchange of electricity between neighbouring countries. This approach not only bolsters regional stability but also allows countries to complement each other's energy profiles and provide mutual backup support during times of shortages.

This is where Swedish expertise in everything from grid management systems and smart metering to energy storage technologies and high-voltage transmission lines comes into play. By collaborating with local stakeholders and governments, Swedish companies offering sustainable and innovative energy transmission solutions can help bridge the energy access gap and drive economic growth and social progress in Africa.

This report provides an overview of the potential in Africa's energy transmission sector, while looking into the opportunities for Swedish companies in six selected markets – Morocco, Mozambique, Nigeria, South Africa and The Democratic Republic of the Congo – where the current outlook is particularly promising.

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SWEDISH EXPERTS SHAPING THE FUTURE OF ENERGY TRANSMISSION

KEY SWEDISH COMPANIES IN THE TRANSMISSION AND DISTRIBUTION SECTOR

Sweden is a world leader in the energy transmission sector, with a number of companies that export their products and services to countries all over the world. These companies offer a wide range of products and services, including high-voltage transformers, circuit breakers, transmission lines, power cables, and high-voltage power transmission components.

Swedish energy transmission specialists play a vital role in the global energy industry, and their products are essential for the safe and reliable transmission of electricity. They are also at the forefront of developing new technologies to improve the efficiency and sustainability of the energy sector.

COMPANIES	2022 TURNOVER (BN SEK)	BRIEF DESCRIPTION
Hitachi Energy	14.23	Power grid technologies and sustainable energy solutions
ABB	13.46	Energy transmission, distribution, and industrial automation
SIEMENS energy	13.03	Expertise in power generation, transmission, and distribution systems
NKT	7.08	Cutting-edge cable solutions for power transmission and distribution
linxon	1.38	Substation solutions, focusing on engineering and delivering critical infrastructure for power T&D networks

"We have been closely monitoring the progress of energy transmission projects in Africa, such as the extensive interconnectors linking Tunisia to Italy and Morocco to the UK. These were once considered ambitious aspirations but are now viewed as feasible achievements."

Sales Manager for Africa at a leading cable supplier to the energy sector

CURRENT PARTNERSHIPS BETWEEN SWEDISH ORGANIZATIONS AND AFRICA'S ENERGY SECTOR

In 2015, Sweden became the first foreign government to support Power Africa, pledging USD 1 billion over a decade. This funding comprises grants for transmission and distribution projects, alongside guarantees and loans to stimulate investments in the energy sector. Power Africa and Sida continue collaborating to:

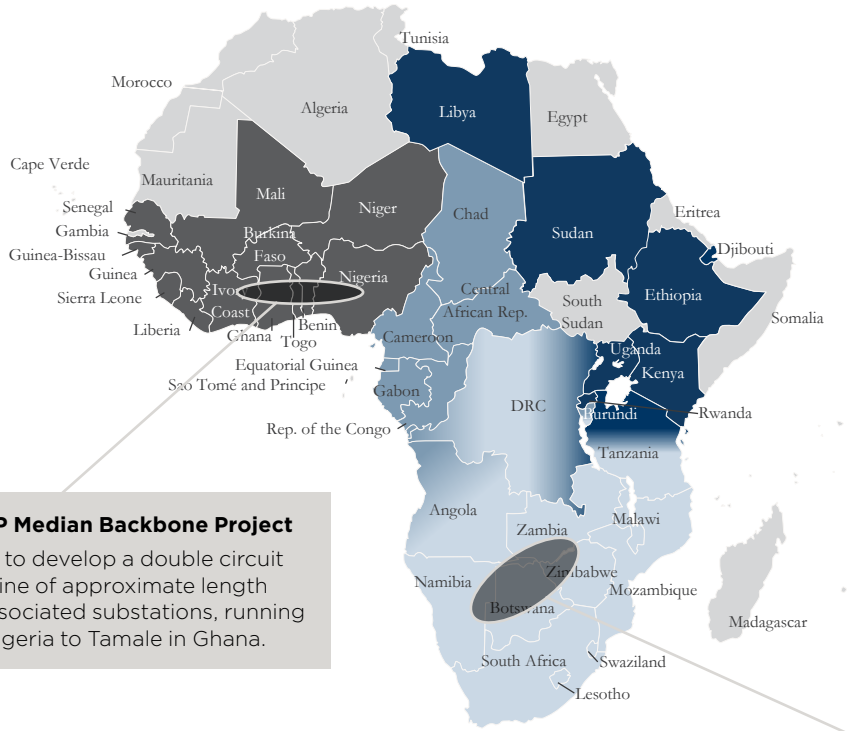
- Expand mini- and off-grid solutions for renewable electricity in sub-Saharan Africa
- Enhance energy efficiency to increase available megawatts
- Utilise financial guarantees to facilitate power sector transactions
- Back Power Pools and other initiatives to boost renewable energy generation and regional power access

In collaboration with the African Development Bank (AfDB), Swedfund supports Mozambique in the development of the new National Control Center for the grid. AfDB and other partners have committed to funding this crucial investment for the country's energy development strategy. Swedfund is also supporting the development of interconnectors between Zambia and Malawi, as well as Angola and Namibia. In these projects, Swedfund focuses on environmental and social impact assessments. Furthermore, Swedfund and AfDB are jointly working on a project to develop a model for increased private investments in transmission infrastructure in the region.

POWER POOLS UNLOCK SUB SAHARAN AFRICA'S TRANSMISSION CORRIDORS

COLLABORATION IS KEY TO MAINTAIN EFFICIENCY OF POWER POOLS IN SUB SAHARAN AFRICA

Power pools play an important role in Sub Saharan Africa's electricity generation and transmission sectors. The costs to address the region's power needs are enormous and will require collaboration with the private sector. Regional stakeholders and agencies have undertaken to reform their electricity sectors but several issues still need to be resolved in the process, for example governance, capacity to deliver, payment schemes and providing the right type of electricity for each region.



Example 1: WAPP Median Backbone Project

The project plans to develop a double circuit HV transmission line of approximate length 1,600 km, with associated substations, running from Shiroro in Nigeria to Tamale in Ghana.

Example 2: ZiZaBoNa Project

The project aims to construct a 400/330kV interconnector line to establish interconnections between Zimbabwe, Zambia, Botswana and Namibia.

SUB SAHARAN POWER POOLS

DRC is shared between the SAPP, the CAPP and the EAPP; Tanzania is shared between the EAPP and the SAPP; Burundi is shared between the EAPP and the CAPP; and Angola is shared between the SAPP and the CAPP

- West African Power Pool
- East African Power Pool
- Central African Power
- Southern Africa Power Pool

MOROCCO

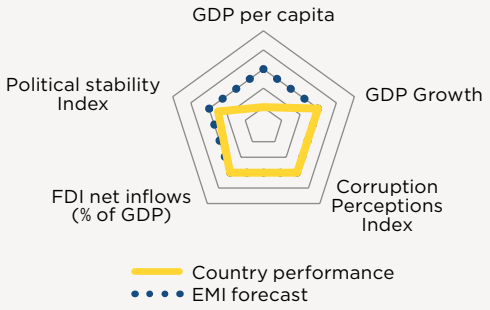
The Kingdom of Morocco, located in the Maghreb region of North Africa, ranks as Africa's 5th largest economy, with a population of around 37 million and a GDP of USD 138 billion. Renowned for its political stability, Morocco has modernised its political and economic systems through reforms. The nation proactively addresses poverty, unemployment, and human rights concerns, standing out as a stable regional leader. Shifting from agricultural reliance, Morocco's economy has transformed into a diversified blend of services, industry, and agriculture.

Morocco's energy transmission network, combining Ultra-High Voltage (UHV) and High Voltage (HV) lines, has hit a pivotal stride. By 2022's end, the network covered no less than 28,663 kilometres, marking 1.1% growth. Morocco achieved universal electricity access in 2020, showcasing its commitment to modernised energy infrastructure, fostering dependable power distribution, and positively impacting its societal and economic landscape.

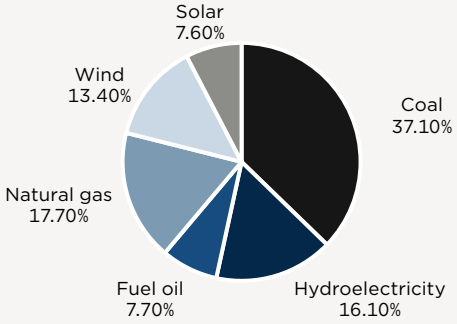
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- **Renewable energy impact:** Morocco's focus on renewables has reshaped its energy transmission. Government policies like feed-in tariffs and tax incentives have facilitated the growth of renewable energy projects.
- **Infrastructure investment:** The green transition has unlocked considerable infrastructure spending. New lines, substations, and upgrades are being pursued to accommodate RE integration.

Key country indicators (2022)[i]



Morocco's electricity production sources (2022)[ii]



KEY STAKEHOLDERS	TYPE	ROLE
Ministry of Energy Transition and Sustainable Development	Government department	Formulates and implements energy and environmental policies and regulations
National Electricity Regulatory Authority	Regulatory body	Regulatory authority ensuring sector functionality, setting tariffs, and enforcing regulations
National Office of Electricity	Government agency	State-owned utility overseeing energy transmission and distribution

OPPORTUNITIES FOR SWEDISH COMPANIES

- New interconnection between Morocco and Portugal, HVDC link with a capacity of 1,000 MW
  745 MEUR
- Xlinks project - 4 HVDC submarine cables of 3,800 km between Morocco and UK
  22,967 MEUR

[i] IMF, World Bank, Transparency International, 2022
[ii] International Trade Administration (ITA), 2022

NIGERIA

The Federal Republic of Nigeria, located in West Africa's southeast, boasts a substantial GDP of USD 477 billion and is home to a population of approximately 192 million, ranking as the seventh most populous country.

In 2022, Nigeria's economic recovery faced unexpected challenges, including inflationary pressures. Geopolitical tensions, notably the Russia-Ukraine conflict, disrupted supply chains and drove up oil prices, causing concerns about inflation. Nigeria, a major African oil producer, grappled with issues like pipeline vandalism and oil theft, hindering growth. The government's proactive measures aim to enhance oil production by late 2023. The imminent launch of domestic refineries, such as Port Harcourt and Dangote, is expected to alleviate foreign exchange pressures, strengthen the national currency, and bolster external reserves, offering a more promising outlook. Nigeria's power sector grapples with a complex challenge: despite an installed capacity of 12,910 MW and an available capacity of 7,652 MW, average domestic power generation is limited to approximately 4,000 MW.

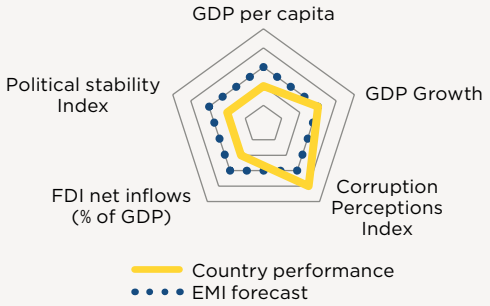
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- **Adoption of the Electricity Act 2023:** Liberalisation of electricity generation, transmission, and distribution at the national level, empowering states, companies, and individuals to participate in these activities within their territories.
- The Act also introduces **mechanisms to incentivise investments** in renewable energy projects, such as feed-in tariffs – a policy that guarantees a fixed price for renewable electricity fed into the grid, and tax incentives.

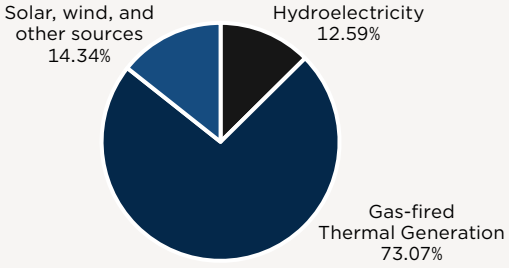
OPPORTUNITIES FOR SWEDISH COMPANIES

- Nigerian Electricity Transmission Access Project (NETAP) – *490 MUSD*
- 330 kV Nigeria - Benin Interconnection Reinforcement Project – *126 MUSD*

Key country indicators (2022)[i]



Nigeria's electricity production sources (2022)[ii]



KEY STAKEHOLDERS	TYPE	ROLE
The Federal Ministry of Power	Government	The policy making arm of the Federal Government with the responsibility for the provision of power in the country
States' Ministries of Energy and Mineral Resources	Government	Developing Energy and Mineral Resources for Wealth and Job Creation within the States
Transmission Company of Nigeria	Government agency	Manages the electricity transmission network in the country
Rural Electrification Agency	Government agency	Electrification of rural and unserved communities

[i] IMF, World Bank, Transparency International, 2022
[ii] Abuja Electricity, 2022

KENYA

Situated on the equator, Kenya is a major economy on Africa's east coast. With a population of 55 million and a GDP of USD 110 billion Kenya lands at a top 10 spot among the African countries both in terms of market size and economic power.

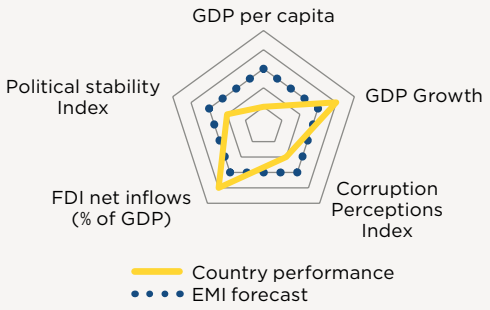
In 2022, Kenya held an election which led to a democratic and non-violent transition of power. This election showcased the stability of the country and its focus on economic growth. The newly elected president has an outspoken agenda to end corruption in the country which hopefully will yield results in the upcoming years.

The power sector is one of the most developed in the sub-Saharan region, with modern regulations regarding Independent Power Providers which has led to a high electricity access rate of 75%.

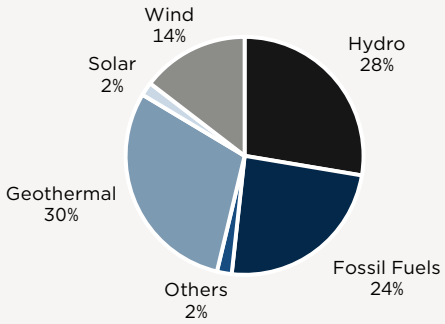
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- Kenya has a strong focus on **transforming its energy sources from fossil fuels to lower-carbon alternatives** including plans to construct nuclear power plants.
- In February 2023, the **two first PPPs** within energy transmission were launched – one 440 KV (165 km) and one 220 KV (72 km) transmission lines.

Key country indicators (2022)[i]



Kenya's electricity production sources (2022)[ii]



OPPORTUNITIES FOR SWEDISH COMPANIES

Medium term, 2023–2027, KETRACO plans to expand the transmission grid by 6,218 km, adding 12,000 MVA of substation capacity at an estimated cost of 3,3 billion USD. Examples of upcoming projects are:

- *Baringo–Korosi Line, 400 kV AC Transmission line*
- *Isinya–Konza Line, 400 kV AC Transmission line*
- *Kangundo–Thika Line 400 kV AC Transmission line*
- *Kiambu North–Uplands Line 400 kV AC Transmission line*

KEY STAKEHOLDERS	TYPE	ROLE
Kenya Power and Lighting Company	Majority state owned company	Transmission and distribution of electricity
Kenya Electricity Generating Company	State owned company	Government enterprise responsible for 60% of Kenya's power generation
Ministry of Energy and Petroleum	Government department	Formulates and implements energy policies and regulations
Energy & Petroleum Regulatory Authority	Independent regulatory authority	Licensing, Economic regulation, enforcement, compliance, complaints and dispute resolution
Rural Electrification and Renewable Energy Corporation	State owned company	Implementation of rural electrification projects and leading the green energy drive
Kenya Electricity Transmission Company	State owned company	Mandated to construct new transmission lines

[i] IMF, World Bank, Transparency International, 2022
[ii] International Energy Agency, 2022

THE DEMOCRATIC REPUBLIC OF THE CONGO

The Democratic Republic of the Congo (DRC) is the second-largest country in Africa and the 11th largest in the world. With a population of around 112 million, the Democratic Republic of the Congo is the most populous Francophone country.

The DRC is incredibly resource-rich, with vast reserves of minerals such as cobalt, copper, and diamonds. However, despite its potential wealth, much of the population lives in poverty, and the country faces challenges related to corruption and poor infrastructure. The election of Félix Tshisekedi as President in 2019 marked the DRC's first peaceful transfer of power since independence in 1960.

The energy transmission network of the DRC stands as a vital but often underdeveloped aspect of the country's infrastructure. With abundant hydroelectric potential from the Congo River and other water bodies, the DRC has the potential to become an energy powerhouse in the region. However, challenges such as inadequate maintenance, limited funding, and political instability have hindered the expansion and efficiency of the transmission system.

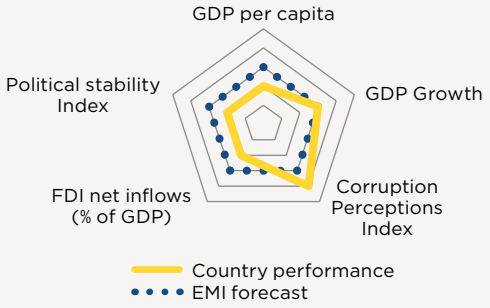
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- A new **Electricity Sector law** was promulgated in June 2014, which aims to consolidate laws relating to electricity generation, transmission, distribution, trading and use, as well as promotion of competition in the sector and support of energy efficiency and environmentally policy.
- In addition, **many universities and academic institutions** in the DRC have founded centers for the research and development of renewable energies such as solar energy and biodiesel.

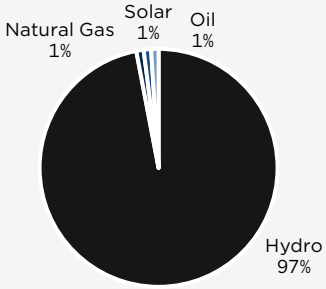
OPPORTUNITIES FOR SWEDISH COMPANIES

- Uganda (Nkenda) – DR Congo (Beni-Bunia-Butembo) 220 kV (400kV) Power Interconnection Project – *200 MUSD*
- DRC (Kolwezi) – Zambia (Solwezi) 330 kV Power Line Interconnection Project – *2,095 MUSD*

Key country indicators (2022)[i]



DRC electricity production sources (2022)[ii]



KEY STAKEHOLDERS	TYPE	ROLE
Ministry of Water Resources and Electricity	Ministry	Formulates and implements water and electricity policies and regulations
Ministry of Hydrocarbons	Ministry	Formulates and implements energy policies and regulations
National Agency for Electrification and Energy Services in Rural and Peri-urban Areas	Government agency	State-owned utility overseeing energy transmission and distribution
Société Nationale d'Electricité	State owned company	State owned company overseeing national market electrical energy

[i] IMF, World Bank, Transparency International, 2022
[ii] International Energy Agency, 2022

SOUTH AFRICA

South Africa has the second largest economy on the continent with a population of 60,6 million and GDP of USD 404 billion. The economy is based largely on private enterprise, although the state participates in many ways.

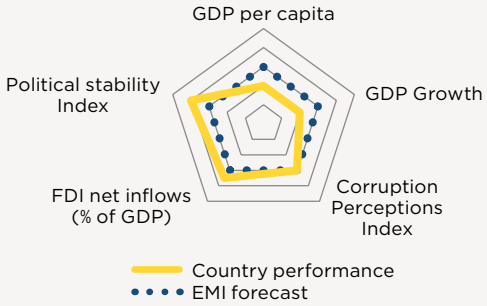
South Africa produces gas and liquid fuel from coal and has limited offshore reserves. 80% of the nation's electricity is supplied through coal-fired power stations giving the country a 14th place ranking of the world's largest greenhouse gas emitters. Nonetheless, South Africa has an electrification rate that is amongst the highest on the continent, with rural electrification around 66%, while electrification in urban areas approximately 93%.

The country has a 2050 vision through the Just Energy Transition Framework to unbundle the state-owned power company – ESKOM into three separate entities responsible for generation, transmission, and distribution.

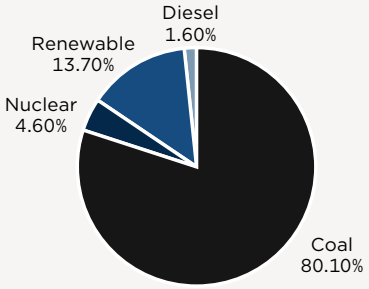
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- South Africa has been working on its **Integrated Resource Plan**, outlining the country's energy mix and plans, including transmission networks.
- The **Renewable Energy Independent Power Producer Procurement (REIPPP)** was launched in 2011 aimed at increasing electricity capacity through private sector investment, with a focus on renewable energies
- The country has been exploring **regional collaborations** and agreements for cross-border power trade

Key country indicators (2022)[i]



South Africa's electricity production sources (2022)[ii]



KEY STAKEHOLDERS	TYPE	ROLE
Ministry of Electricity	Ministry	Formulates and implements electricity policies and regulations
Department of Mineral Resources and Energy	Government agency	Responsible for the overall energy policy and regulation.
ESKOM	State owned company	The state-owned electricity company in South Africa responsible for the majority of power generation and transmission.

OPPORTUNITIES FOR SWEDISH COMPANIES

- Gauteng Province: Many lines need strengthening and new substation erected. Range from 275kV to 400kV
- Western Cape: Strengthening and new substations for 765kV lines
- KwaZulu Natal: New Substations and Lines after restoration is done to those affected by the floods
- Mpumalanga: New 400kV lines across province (Emkhiweni and Wonderkrag))
- Limpopo: integration of Medupi Power station into the grid- construct 400Kv and 765kV lines
- Free State: Strengthening the 400kV line which is operated at 275Kv (Sorata-Tugela 275Kv Line) and building more substations to feed the grid
- Eastern Cape: Strengthening 400kV Lines and Substations in Pembroke and Introducing Gamma-Grassridge 765kV Line
- Northern Cape: Strengthening and Transformer Normalisation Project underway for 400kV lines and new substations

[i] IMF, World Bank, Transparency International, 2022
[ii] CSIR, Statistics on Power Generation in South Africa, 2022

MOZAMBIQUE

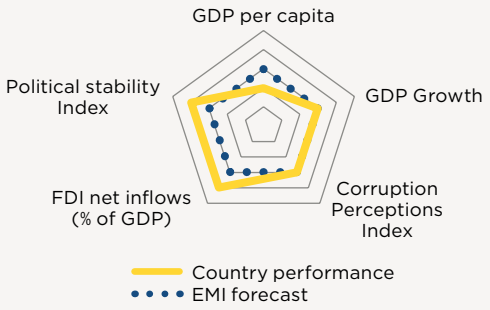
Mozambique is situated on the southeast coast of Africa and has a population of 32 million. The country's status is that of a low-income country with a GDP estimated at USD 17,85 billion.

Mozambique has the largest power generation potential in Southern Africa with untapped coal, hydro, gas, wind and solar resources. Hydropower currently accounts for about 81% of installed capacity. However, natural gas and renewable energy sources represent a growing share of Mozambique's energy mix. Despite the outsized potential, only 29% of the population has access to electricity, due to limited transmission and distribution networks and unfavourable market conditions for new generation.

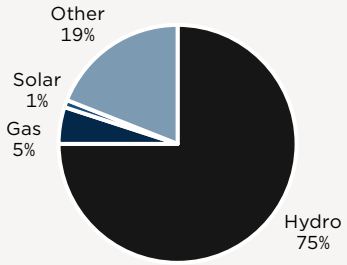
INITIATIVES AND POLICIES IN ENERGY TRANSMISSION

- **The Integrated Master Power Plan.** Power generation, transmission and distribution plan with a goal to increase capacity by 2030. 20% integration of renewable energy into the grid.
- **Electricity Law (Law No. 21/91).** Focused on the regulation of renewable energy. Implemented by EDM in 2017 and is still in effect.
- **National Electrification Strategy (ENE).** National plan to provide high quality affordable and sustainable electricity. 70% from grid and 30% off the grid ensuring new energy access for 10,000 residents by 2030.

Key country indicators (2022)[i]



Mozambique's electricity production sources (2022)[ii]



OPPORTUNITIES FOR SWEDISH COMPANIES

- CESUL - The Mozambique Regional Transmission Backbone Project
- Two HV lines, 400Kvac line and a 550kV DC line which will run from the south of Mozambique into South Africa. Phase 1: 800 km line Maputo City to Inhambane is under construction
- Mozambique-Zambia Interconnector 400kV HVAC line
- Mozambique Malawi Interconnector
- Expansion of the Hidroelectricia Cahora Bassa's (HCB) Hydropower plant
- Construction of the Mphanda Nkuwa hydropower plant

KEY STAKEHOLDERS	TYPE	ROLE
Ministry of Mineral Resources and Energy	Government agency	National main energy planning entity supervising the operation & development of the energy sector. Develops relevant policies and strategies.
Electricidade de Moçambique	State owned company	Establish and operate public service in generation, transmission, and distribution of energy.
Fundo de Energia	Government agency	Promotes energy access and was intended to gather and administer funds to support public and private generation and distribution initiatives.

[i] IMF, World Bank, Transparency International, 2022
[ii] OurWorldInData, Energy, Mozambique, 2022

FIVE KEY SUCCESS FACTORS FOR DOING BUSINESS IN AFRICA

Africa is a diverse continent, thus each market should be approached with a tailor-made strategy

	COMMON CHALLENGES	RECOMMENDED ACTIONS
1. Do your homework	• Market data is not often readily available or reliable • Challenge to assess continuous economic and political changes and regional variations within large markets • Decision-makers are not easily identified	• Target markets based on growth needs, capital requirements, and time horizon • Be aware of regional variations within larger countries, especially in Africa • Conduct due diligence with the support of local expertise
2. Define and develop strategy		• Be asset light in order to maintain responsiveness to fast-paced changes in market conditions • Iterate go-to-market approach as your market position evolves • Plan to scale long term and stay relevant
3. Adapt business model	• Economic volatility of buyers in resource-rich markets and high dependence on development funds in resource-poor markets • Sales process is time consuming given lack of access to decision-makers, bureaucratic processes, and the strong interpersonal nature of business relationships	• Turn the rapid pace of change into a competitive advantage by adapting existing products and services to meet specific needs • Support in adapting offering to local tech maturity levels • Go beyond 'quality' USP and focus on relationships and knowledge exchange
4. Go long and be resilient	• Procurement processes are more complex than in Europe; decision-making takes longer • Long term contracts in local currency carry higher risk exposure; contract negotiations and extensions are often delayed • Difficult to secure financing, resulting in payment delays and postponed due dates for large projects	• Plan and build long term relationships with government and local stakeholders • Build resilience and mitigate short-term volatility by: – Hedging financial risks – Keeping the business as lean as possible – Diversifying portfolio
5. Ensure local integration	• Business culture characterised by lack of organisation and structure, and buyers are often hard negotiators • Whilst easier to enter indirectly (e.g., via distributors), selling indirectly makes it harder to learn key success factors in local culture	• Show commitment and dedication to the market: – In Africa, all business is personal – Invest in local presence via greenfield, alliance or partnership – Hire locally whenever possible, and develop leaders internally

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We help Swedish companies grow global sales and international companies invest and expand in Sweden.

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